LATE QUATERNARY GROWTH AND GEOMORPHOLOGY OF THE COYOTE BLIND THRUST SYSTEM, EAST LOS ANGELES

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ABSTRACT We undertook analysis of IFSAR topography, mapping of late Quaternary aquifers and correlation with new mini sosie seismic reflection profiles to define the characteristics of fault-related folding of the Santa Fe Springs and West Coyote blind thrust segments in the eastern Los Angeles basin. Our goal was to define uplift rates to help determine fault slip rates (based on structural models produced by coworkers Shaw - Harvard and Dolan - USC). We also assessed segmentation and likely structural linkages between the two thrust/fold segments. Results of our work are discussed below in separate sections on surface geomorphology, subsurface structure and segmentation.

TOPOGRAPHY Research undertaken for this award was aimed at determining the geomorphology, fault slip rate, and segmentation for portions of the Puente Hills blind thrust system. Work was performed in cooperation with James Dolan (USC) and John Shaw (Harvard). For the geomorphic analysis, high resolution surface topography was derived from Interferometric Side Aperature Radar (IFSAR) to map features produced by Late Pleistocene and Holocene fault-related folding above the Santa Fe Springs and West Coyote blind thrust segments. Digital elevation models produced by IFSAR have a horizontal resolution of 5m and a vertical resolution of 30 cm. Although significantly modified by urbanization, fold scarps are apparent along the entire length of the forelimb of the West Coyote segment where they form a sharply curved (concave towards the north) surface trace. Topography produced by recent folding across the Santa Fe Springs segment is less pronounced and is most apparent along a scarp near the southern portion of the city of Santa Fe Springs (Figure 1). The western portion of the Santa Fe Springs fold segment displays much lower relief (Figure 2). We were able to trace the forelimb of the fold to a point 4 km west of the San Gabriel River, the western limit of our IFSAR data (Figure 2). Whereas the morphology of the scarp at west Coyote is narrow and abrupt on the IFSAR imagery (Figure 3), the forelimb of the Santa Fe Springs segment is much broader and more diffuse, except for the higher section along its eastern extent. Variation in scarp width may be both a product of the deformation mechanisms that act to build the scarp, and urbanization (which has a greater effect on the lower scarps. Variation in scarp morphology along strike is greatest along the Santa Fe Springs